What is claimed is:

1. A silicon oxide etching solution comprising the product of at least one bifluoride source compound dissolved in a solvent consisting of one or more carboxylic acids, and further comprising from about 0.5 to about 3 percent by solution weight of hydrofluoric acid and from about 1 to about 5 percent by solution weight of water, wherein the total bifluoride source compound concentration is between about 1.25 and about 5.0 moles per kilogram of solvent

2. The solution of claim 1, comprising the product of a monocarboxylic acid having from 0 to five carbon atoms in addition to the carboxylate carbon.

3. The solution of claim 2, wherein said monocarboxylic acid is acetic acid.

4. The solution of claim 1, wherein at least one bifluoride source compound is selected from the group consisting of ammonium fluoride, ammonium bifluoride, fluoroborates, fluoroboric acid, tin bifluoride, antimony fluoride, tetrabutylammonium tetrafluoroborate, aluminum hexafluoride, hydrogen fluoride acid addition and quaternary salts of organic nitrogen-containing compounds and mixtures thereof.

5. The solution of claim 4, wherein a bifluoride source compound is ammonium fluoride, or ammonium bifluoride.

6. The solution of claim 5, consisting of the product of from about 7% to about 14% by solution weight ammonium fluoride, from about 1.5% to about 5% by solution weight water, from about 0.5% to about 3% by solution weight hydrofluoric acid and acetic acid.

7. The solution of claim 4, wherein said organic nitrogen-containing compounds are selected from the group consisting of aliphatic amines, aromatic amines and nitrogen-containing heterocycles.

8. A method for selectively removing silicon oxides from metal surfaces comprising contacting a metal surface having silicon oxides thereon with the etching solution of claim 1 for a period of time effective to remove at least a portion of said silicon oxides.

9. The method of claim 8, wherein said contacting step is performed on said surface until essentially all of said silicon oxides have been removed.

10. The method of claim 8, wherein said metal surface comprises one or more metals selected from the group consisting of aluminum, copper, tungsten, tin, titanium, nickel, vanadium and lead.

11. The method of claim 10, wherein said metal surface consists essentially of aluminum.

12. The method of claim 8, wherein said silicon oxides are removed from a semiconductor bonding pad surface.

13. The method of claim 12, wherein said bonding pad surface consists essentially of aluminum.

14. The method of claim 13, wherein said silicon oxides were applied to said bonding pad surface as a passivation coating.

15. The method of claim 8, wherein said silicon oxides are removed from a metal surface to open a via in a semiconductor device.

16. The method of claim 8, wherein said silicon oxides are removed from the metal parts of equipment used for the reactive ion etching of semiconductor devices.

17. The method of claim 16, wherein said metal parts have anodized aluminum surfaces.

18. The method of claim 16, wherein said metal parts are used in sputtering equipment or gaseous deposition equipment.

19. The method of claim 8 wherein said etching solution comprises the product of a bifluoride source compound and a monocarboxylic acid, hydrofluoric acid and water.

20. A method for selectively removing metal silicates from metal surfaces comprising contacting a metal surface having a silicate of said metal formed thereon with the etching solution of claim 1 for a period of time effective to remove at least a portion of the metal silicate.

21. The method of claim 20, wherein said metal is titanium or aluminum.

22. The method of claim 20, wherein said metal surface is at least partially coated with at least one organic dielectric.

23. The method of claim 20, wherein said contacting step is performed until essentially all of said metal silicate has been removed.